

LISTING OF CLAIMS:

The following listing of claims will replace all prior versions and listings of claims in the application:

What is claimed is:

1. (Previously presented) A process for the production of light-diffracting microstructures in a layer of photoresist on a substrate, which are produced by superimpositions of a first relief structure with at least one second relief structure serving as a diffraction structure, comprising the steps of
 - a) producing a layer of photoresist with a first relief structure on a flat substrate, which is produced by forming the shape of a relief die disposed in opposite relationship to the substrate, into the free surface of the layer,
 - b) removing the relief die,
 - c) producing an interference pattern on the relief structure, wherein coherent light is divided into a partial beam and a reference beam and the partial beam and the reference beam are caused to interfere including a predetermined intersection angle on the shaped first relief structure,
 - d) orienting the interference pattern which includes fringes of a high level of light intensity separated by fringes of a low level of light intensity in respect of azimuth in relation to the first relief structure by rotation of the substrate about a normal to the plane of the substrate,
 - e) exposing the first relief structure in the photoresist layer by means of the interference pattern during a predetermined time,
 - f) developing the photoresist during a predetermined time, wherein material of the photoresist which was changed during the exposure operation is partially removed and grooves of the diffraction structure are produced in the first relief structure, and
 - g) drying the photoresist.

2. **(Currently Amended)** A process as set forth in claim 1, wherein in step f) the time for development of the photoresist is such that the grooves of the diffraction structure reach a depth of at most 500 nm, ~~preferably at most 250 nm.~~

3. (Previously presented) A process as set forth in claim 1, wherein in step a) firstly the photoresist layer is produced on the flat substrate, solidified by the action of heat and then the relief die mounted on a stamping punch is lowered into the surface of the photoresist layer so that the shape of the first relief structure is produced as a negative of the relief die.

4. (Previously presented) A process as set forth in claim 1, wherein in step a) the layer is produced by casting, wherein the liquid photoresist is cast between the substrate and a relief die and that after solidification of the photoresist under the effect of heat and removal from the mold the free surface of the layer has the first relief structure as a negative of the relief die.

5. (Previously presented) A process as set forth in claim 1, wherein in step a) a periodic grating is shaped in the photoresist layer as the first relief structure.

6. (Previously presented) A process as set forth in claim 1, wherein in step a) a cross grating is shaped in the photoresist layer as the first relief structure.

7. (Previously presented) A process as set forth in claim 1, wherein in step a) a periodic grating is shaped in the photoresist layer with a spatial frequency in the region of between 1 line/mm and 1000 lines/mm as the first relief structure.

8. (Previously presented) A process as set forth in claim 5, wherein in step b) the intersection angle between the partial beam and the reference beam is so set that the diffraction structure produced is a grating having a spatial frequency which corresponds at least to five times the spatial frequency of the relief structure.

9. **(Currently Amended)** A process as set forth in claim 1, wherein in step a) ~~one of the light-scattering matt structures is shaped into the photoresist layer as~~ the first relief structure is shaped into a light-scattering matt structure.

10. (Previously presented) A process as set forth in claim 1, wherein in step a) a relief die with a structure with at least one paraboloid surface and/or a cone tip is used for producing the shape of the first relief structure.

11. (Previously presented) A process as set forth in claim 1, wherein the relief structure is shaped with a structural depth (T) in the region of between 0.1 μm and 100 μm .

12. (Previously presented) A process as set forth in claim 1, wherein prior to execution of step g) the photostructuring is repeated with at least one further diffraction structure with the steps c) through f), wherein in step d) the first relief structure with the grooves of the diffraction structure is oriented in relation to a new interference pattern by rotation of the substrate about the normal.

13. (Previously presented) A process as set forth in claim 1, wherein upon repetition of the

photostructuring operation in step b) the intersection angle between the partial beam and the reference beam is changed.

14. (Previously presented) A process as set forth in claim 1, wherein in step b) the intersection angle between the partial beam and the reference beam is so set that the diffraction structure is produced with a grating period of at most 500 nm.

15. (**New**) A process as set forth in claim 1, wherein in step f) the time for development of the photoresist is such that the grooves of the diffraction structure reach a depth of at most 250 nm.